



## **IDEM's Surface Water Quality Assessment Program**

### **Macroinvertebrate Community Assessment Program**

#### **Program Objective**

The Biological Studies Section (BSS) conducts biological community assessments of Indiana rivers and streams through the collection, study and assessment of macroinvertebrate communities (animals without a backbone that can be seen with the naked eye, such as aquatic insects, snails, crayfish, mussels, etc.). Any biological community assessment is a measurement of a collective ecosystem level response to environmental stress and gives an annual picture of the worst conditions, which have been imposed on the ecosystem at the point being assessed. When conducted in conjunction with chemical analysis of specific water quality parameters and aquatic habitat quality, they provide a more complete and comprehensive picture of ecological quality of the watershed.

The Biological Studies Section uses these macroinvertebrate and habitat studies to establish biological references to which all 35,673 miles of Indiana streams may be compared in order to identify impaired streams or watersheds. These data are used to determine compliance with the existing narrative biological criteria in the Indiana water quality standards, determine the extent of ecological harm, and make correlation to physical and/or chemical impairments that may occur. These data provide the information needed to develop models to assess changes in Indiana ecosystems that affect aquatic life.

In the course of its various monitoring and assessment field activities the staff finds obvious biological impairment due to point and non-point source related problems which are immediately referred to the appropriate IDEM programs. The Biological Studies Section also participates in evaluating macroinvertebrate monitoring and assessment programs on the Ohio River with the Ohio River Valley Water Sanitation Commission (ORSANCO).

#### **Program Participants**

The staff of the Biological Studies Section of the Assessment Branch conducts this particular monitoring program. No contractual laboratory services are needed as field samples collected in the field are returned to the BSS Laboratory for enumeration and identification. Data reduction is conducted during the winter months by the section's staff and data are maintained in a sample tracking and relational database format.

#### **Program Description**

Media:	Surface water; rivers, streams and lakes
Study Area:	Statewide
Site Selection Type:	Presently 890 different sites on over 500 different rivers and streams in Indiana have been sampled. These sites include sites sampled in 90 of the states 92 counties. These data represent stream macroinvertebrate communities collected at wadeable stream and rivers sites and were derived from studies to establish reference conditions.

## Program Description (continued)

Sampling Frequency: Sampling is limited to July-October each year.  
Data Collected: Benthic macroinvertebrate community assessment samples are collected by several methods from Indiana rivers and streams. Biological samples are museum curated and maintained for the state. Macroinvertebrate community assessment data evaluating the compositional, structural and functional integrity of the biological community is being established. Concurrent aquatic habitat assessments are conducted to determine if either site specific habitat degradation or water quality causes can be determined. These data are used in determining the baseline reference condition for the calibration of a state wide macroinvertebrate index of biotic integrity (mIBI) and this is in turn being used in the surface water quality monitoring strategy of the Office of Water Quality.

ORSANCO, of which IDEM is a member of, has taken on the responsibility of monitoring the macroinvertebrate communities of the Ohio River and the lower reaches of its major tributaries (including the Wabash River). ORSANCO has subcontracted some of these studies to the Ohio Biological Survey and to Universities.

Universities and consulting companies employed by dischargers periodically conduct site or watershed specific macroinvertebrate community assessments within Indiana lakes, rivers, and streams.

## Program Products

- < Contribution to Indiana's biennial Integrated Report
- < Support for 303(d) List of impaired waters in Indiana.
- < Biological Impairment Reports to Inspectors
- < Periodic technical reports on biological watershed assessments and trends
- < Environmental Indicators development to measure success of environmental objectives in support of the Environmental Performance Partnership Agreement (EnPPA) between Indiana and U.S. EPA.
- < Support of Indiana's Remedial Action Plan for the Northwest Indiana Area of Concern.
- < Support the Triennial Review of Indiana Water Quality Standards

## Technical Notes

The USEPA standardized sampling methods <http://www.epa.gov/owow/monitoring/rbp/> are utilized in the macroinvertebrate community assessment program. An Index of Biotic Integrity (IBI) using single habitat sampling (riffle) has been developed and a multi-habitat sampling method and IBI is being developed for probability site sampling.

## Contact Information

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**Report Environmental Emergencies:**  
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**Pollution Complaint:**  
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**Questions and Comments:**  
[www.IN.gov/idem/contact/questions.html](http://www.IN.gov/idem/contact/questions.html)

**For More Information on IDEM's Office of Water Quality...**

**Assessment Branch** (Surface water quality monitoring: rivers and streams, lakes, water quality standards) Shadeland Office, Indianapolis (317) 308-3173

**Compliance Branch** (Compliance and inspections, data and information services, wastewater certification and continuing education) Indiana Government Center North, Indianapolis (317) 233-2545

**Drinking Water Branch** (Public water supply supervision and ground water protection) Shadeland Office, Indianapolis (317) 308-3308

**Permitting Branch** (Facilities Construction & Engineering Support, Industrial & municipal permits, modeling, and wet weather) Indiana Government Center North, Indianapolis (317) 232-8760

**Watershed Planning Branch** (Rules development, wetlands, TMDL, watershed management) Indiana Government Center North, Indianapolis (317) 233-8488